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Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
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MDS Global Holding Ltd.
5/1 Merchantsstreet
Valetta VLT 10
MALTE

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If no title is shown please refer to the description.
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Dispensing of a substance

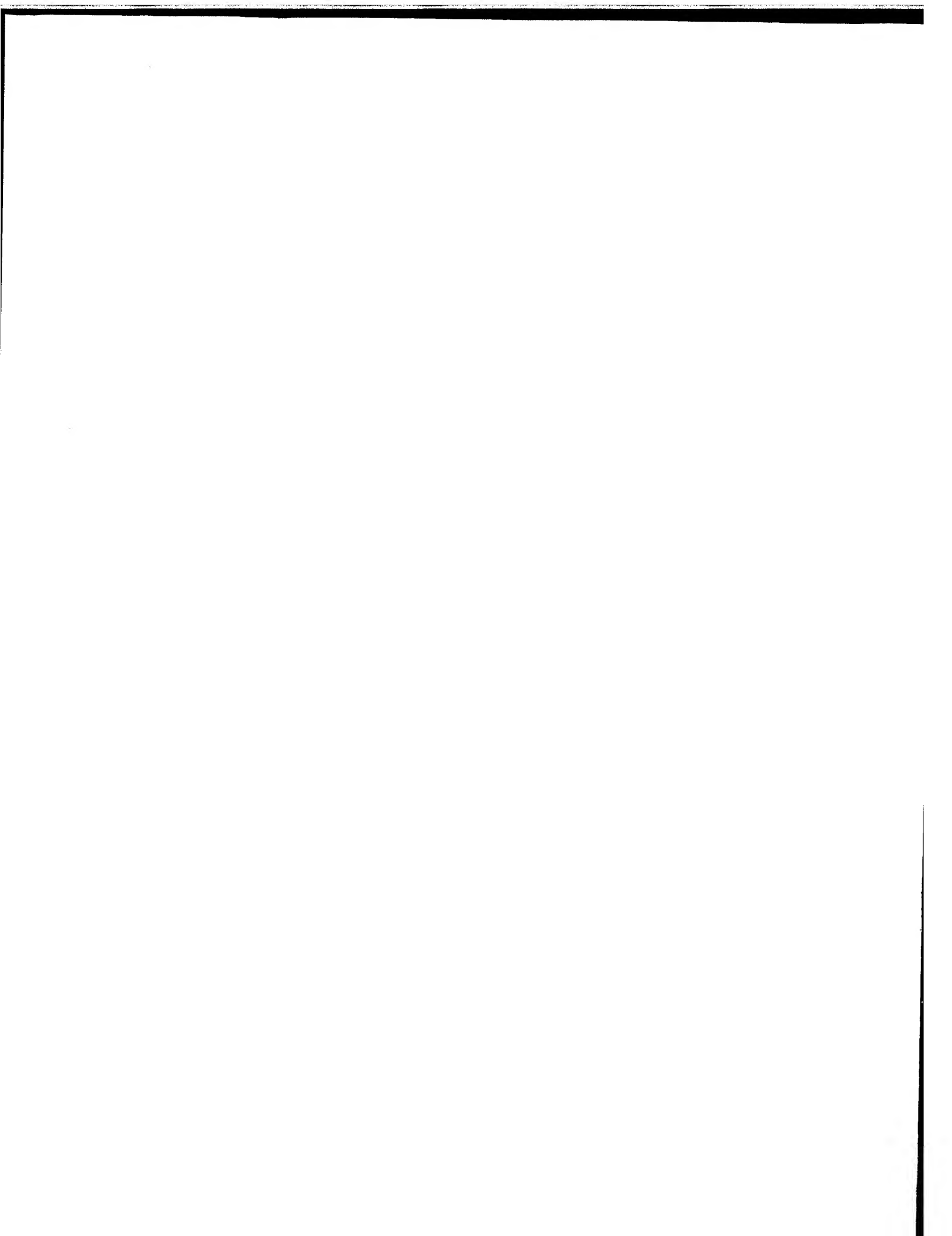
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Dispensing of a substance

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The present invention relates to dispensing of a substance from a container by means of a dispensing apparatus.

10 This is for example known from EP 278 773, where a beverage dispensing apparatus is shown. The dispensing apparatus is adapted to empty a bag containing a flavouring constituent for the preparation of a carbonated beverage. The bag is inserted into a receiving and actuating unit, which has means to compress the bag and expel the content out of it into a discharge nozzle. The discharge nozzle is also connected to a feed conduit for feeding carbonated water. The
15 feed conduit is provided with a closing valve which can be opened by operating a lever by pressing a serving cup against it. The flavouring constituent and the carbonated water are thus mixed in the discharge nozzle before they are dispensed in the serving cup. When different bags with different flavours are inserted subsequently in
20 the receiving unit, a cross contamination between different flavours can occur. Next to the part for serving carbonated drinks the known dispensing apparatus has also separate spigots for hot water and cold water.

The present invention proposes to dispense a substance from a
25 container filled with a single portion of a substance. The container comprises a deformable body, preferably made of sheet material, defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed to the
30 circumferential rim by means of a circumferential sealing seam.

Such a container as such is known. For example EP 299 571 shows a container for a small quantity of milk, cream or the like. The container has a bottom and a wall of rigid plastic defining a filling cavity. Further, the container is provided with a channel which is in
35 communication with the filling cavity. A cover sheet covers the filling cavity and the channel. The cover sheet has a pulling tab by means of which it can be pulled away at the channel for forming an opening through which the content of the container can be dispensed.

According to the invention the substance, e.g. syrup for a soft drink is dispensed directly from the container into a serving cup or a bottle. Also the water is dispensed into the cup such that mixing takes place in the cup thereby preventing the contamination of the dispensing apparatus with the substance.

The invention proposes to open the container with the substance by making use of the deformability of the cover sheet. The container is held in receiving means and the cover sheet is engaged with a support surface provided with a recess. The support surface supports the cover sheet except at the position of the recess. The recess is positioned at least over a part of the circumferential sealing seam. Then the container body is compressed whereby the substance is pressurized and the cover sheet bulges out into the recess such that the sealing seam is broken at the location where the bulge is formed resulting in the container being open. This way of opening the container requires no cutting means or other means adapted to open the container that could get contaminated with the substance, which is advantageous in view of hygiene.

Preferably the container is manufactured by a vacuum or thermo forming process. A flat sheet, preferably of plastic or aluminium, is placed in a vacuum or thermo forming apparatus with a forming die and multiple container bodies are formed simultaneously in the sheet by vacuum forming the filling cavities into the die. Then the sheet with the filling cavity is placed in a filling machine and filled with substance. The sheet with the container bodies is covered by a sheet of covering foil that is sealed over it. Finally, the sheet with the closed containers is placed in a punch machine, where the perimeter of the circumferential rim of the body is formed by punching out waste material between the containers.

Preferably the sheet of covering foil is manufactured of aluminium or another material, preferably a multilayer material. In an advantageous embodiment the covering sheet is provided with identification means. The identification means correspond to the substance contained in the container so as to allow automatic identification of the container. This container can be placed in a dispensing apparatus comprising identification recognition means for automatically identifying the container and the substance therein.

The invention will become more apparent from the following description with reference to the drawing, in which:

Fig. 1 shows a view in perspective of a preferred embodiment of a container according to the invention,

5 Fig. 2a shows a front view of the container of Fig. 1,

Fig. 2b shows a top view of the container of Fig. 1,

Fig. 2c shows a side view of the container of Fig. 1,

Fig. 3 shows a view in perspective of the container of Fig. 1 in a compressed state,

10 Fig. 4a shows a front view of the container of Fig. 3,

Fig. 4b shows a top view of the container of Fig. 3,

Fig. 4c shows a side view of the container of Fig. 3,

Fig. 5 shows a perspective front view of an embodiment of a drink dispensing apparatus with receiving means for the container of
15 Fig. 1,

Fig. 6 shows a perspective front view of another embodiment of a drink dispensing apparatus with receiving means for the container of Fig. 1,

Fig. 7 is a schematic cross section of the dispensing apparatus
20 of Fig. 6,

Fig. 8 shows a perspective front view of the dispensing apparatus of Fig. 6 with an opened lid of the receiving means,

Fig. 9 shows how the container of Fig. 1 is inserted in the dispensing apparatus of Fig. 6,

25 Fig. 10 shows the container of Fig. 1 is in the full inserted state in the dispensing apparatus of Fig. 6,

Fig. 11 shows how the compressed container of Fig. 3 is removed from the dispensing apparatus of Fig. 6,

Fig. 12 shows an alternative embodiment of a container,

30 Fig. 13 shows another alternative embodiment of a container,

Fig. 14a shows a further embodiment of a container with a dispensing channel with a closed end,

Fig. 14b shows a detail of the container of Fig. 14a,

Fig. 14c shows the dispensing channel of the container of Fig.

35 14a after the channel has been opened,

Fig. 15 shows a top view alternative embodiment of container,

Fig. 16 shows a perspective view of an embodiment of a container with two filling cavities,

Fig. 17 shows a cross section of a container with two filling cavities with different heights,

Fig. 18 shows a top view of the container of Fig. 16,

Fig. 19 shows a top view of a container with two filling
5 cavities with each a different cross section,

Fig. 20 shows a cross section of an embodiment of the receiving means provided with heating elements,

Fig. 21a shows a cross section of an embodiment of the receiving means with a certain piston form before compression of the container,

10 Fig. 21b shows the cross section of the receiving means of Fig. 21a after compression of the container,

Fig. 22a shows a cross section of an embodiment of the receiving means with another piston form before compression of the container,

Fig. 22b shows the cross section of the receiving means of Fig.
15 22a after compression of the container,

Fig. 23a shows a perspective view of the dispensing apparatus of Fig. 6 with a bottle placed in it,

Fig. 23b shows a front view of the dispensing apparatus of Fig. 23b, and

20 Fig. 24 shows a cross section of an embodiment of the receiving means with yet another piston form before compression of the container.

Figs. 1, 2a-2c show a container 1 for containing a substance.
25 The container 1 comprises a deformable body preferably made of plastic sheet material. The body can also be made of another material, e.g. aluminium or laminated cardboard paper. Preferably the body has a bottom 3 and a side wall 4 extending from the bottom 3, which define a filling cavity. On the side opposite the bottom 3 a
30 planar circumferential rim 5 is integral with the side wall 4 and extends outwardly therefrom. The circumferential rim 5 surrounds an opening 6. A cover sheet 7 of foil material is sealed to the circumferential rim 5 by means of a circumferential sealing seam 10 and closes the opening 6. The foil material can be a multilayer
35 material.

In Fig. 2b is shown a top view of the container 1 without the cover sheet. The circumferential rim 5 has an extending tab 8 with a dispensing channel 9 formed by a depression in the tab 8. Further,

the circumferential rim has a gripping tab 11 diametrically opposite the extending tab 8. The cover sheet 7 is also sealed to the extending tab 8 and preferably also to the gripping tab 11.

5 The dispensing channel 9 has an open end 9a at the edge of the extending tab 8. The extending tab 8 with the channel 9 is covered by the cover sheet 7. As can be seen in figs. 2b and 2c, the dispensing channel 9 is separate of the filling cavity, that is, it does not join the filling cavity. When the filling cavity is filled with substance and the covering sheet is applied to the container, zone 10 10b of sealing seam 10 near the dispensing channel 9 forms a barrier for the substance between the cavity and the dispensing channel 9.

Preferably, the zone 10b of the circumferential sealing seam 10 at the location of the dispensing channel 9 is weakened. This can be done by giving the sealing seam 10 a smaller width near the 15 dispensing channel 9 than at the rest of the circumference (see Fig. 2b). Another possibility is to heat the sealing seam 10 locally near the dispensing channel 9, such that it is weakened locally.

When in use the container body can be compressed, thereby pressurizing the content of the container 1. By the increasing 20 pressure on the inside of the container 1, the sealing seam 10 breaks at that zone 10b and a passage is formed between the cover sheet 7 and the area of the tab surface that connects the filling cavity with the dispensing channel, so as to allow substance to pass through the passage from the cavity into the channel 9. This is illustrated with 25 arrows 90 in Fig. 2b.

Figs. 6-8 show a drink dispensing apparatus 61 with a housing 62. On top of the housing 62 is placed a water tank 63, for feeding water. In another embodiment it is also possible to provide the apparatus with an internal water storage tank. It is also possible to 30 connect the apparatus to a water supply line. From the housing 62 is extending a platform 65 for placing a cup 64 on which is to be filled with a drink. Above the cup 64 are arranged three dispensing pipes 66a, 66b and 66c, through which can be dispensed cold water, warm water and carbonated water respectively. At the underside a platform 35 70 is arranged. The platform 70 can be formed as a grid with a collecting receptacle 71 underneath for collecting spilled water. The collecting receptacle 71 can be removable so that it can be cleaned. In a further embodiment an evaporator can be arranged in the

collection receptacle to evaporate spilled fluid, such that the receptacle does not have to be emptied too often.

It is also possible to place bottles or glasses and the like in the apparatus. The bottle can be placed on the platform 70. In Fig. 23a and 23b the dispensing apparatus 61 is shown with a specially designed bottle 230 in it. The bottle 230 has a top part 231 which is adapted to fit in a sealing manner under the receiving means 67 such that dispensed substrate and water cannot be spilled during dispensation. To that end the receiving means 67 can be provided with sealing means like a sealing gasket or the like.

The dispensing apparatus comprises receiving means 67 for receiving a container 1 as is described hereabove, filled with a single portion of a substance, e.g. coffee concentrate or syrup for a soft drink.

In Fig. 7 is shown a schematic cross section of the apparatus 61. The water from the tank 63 can be directed by means of a control system 75 through feed lines 74a to a cooling system 73, a heating system 72 and a carbonating system 71, which are connected with the three dispensing pipes 66a, 66b and 66c respectively by feed lines 74b. The carbonating system 71 preferably comprises a bottle filled with CO₂ (not shown).

It is also possible to have four lines 51-54 that are all connected to one central dispensing pipe 50 as is shown in Fig. 5. The dispensing pipe 50 is directed such that the water is ejected in the beam of substance that is dispensed from the container 1, such that a good mixing between the two is secured. The four lines 51-54 are for feeding hot water, cooled water, water with an ambient temperature and carbonated water to the dispensing pipe 50.

The receiving means 67 have a compression chamber 68 with a variable volume. The compression chamber 68 is delimited by a piston 69 with a screw spindle 69a that is driven by a linear electric motor 69b. The piston is adapted to engage the bottom 3 of the container 1. In other possible embodiments (not shown) the drive means can comprise pneumatic means, hydraulic means or can be adapted to be hand driven.

The piston can have a form adapted to deform the container in a specific form. In Fig. 7 is schematically shown that the piston 69 has a flat front face 69c with a diameter that corresponds

substantially with the inner diameter of the compression chamber 68.

In Fig. 21a is shown another piston 210 with a rear portion 210b with a constant diameter that substantially corresponds to the inner diameter of the compression chamber 68, and with a
5 substantially cone shaped front portion 210a with a front face 210c which has substantially the same diameter as the bottom 3 of the container 1. The cone shaped portion 210 has a surface 210d with a convex curved form. This form of the piston 210 allows the container 1 to deform and wrinkle in the area between the surface 210d of the
10 cone shaped portion 210a and the wall 68a of the compression chamber 68, as can be seen in Fig. 21b.

In Fig. 22a is shown a piston 220 with a cone shaped portion 220a with a linear decreasing surface 220d. The front face 220c has a smaller diameter than the diameter of the bottom 3 of the container
15 1. The form of the piston 220 allows the container 1 to deform and fold in the area between the surface 220d of the cone shaped portion 220a and the wall 68a of the compression chamber 68, as can be seen in Fig. 22b.

The pistons 210 and 220 can advantageously be used to compress
20 the container 1 such that almost all substance in the filling cavity is dispensed. This means that there are only small losses which is advantageous from an economic view point.

In Fig. 24 a piston 240 is shown with a scraping edge 241. The scraping edge 241 prevents that during compression of the container
25 no container material gets stuck between the inner surface 68a of the compression chamber 68 and the piston 240, which could cause jamming of the piston.

The receiving means 67 have a covering lid 80 which hinged and can be opened (see Fig. 8) and closed (see Fig. 6). Further, the
30 receiving means 67 have a front plate 81. The front plate 81 is provided with a recess 82 with a depth substantially corresponding to the thickness of the circumferential rim 5 with the extending tab 8 and the gripping tab 11 of the container 1. The bottom of the recess 82 forms a stop face engaging the back side of the circumferential
35 rim 5. Further, there is provided in the recess 82 a deeper recess 83 in which the dispensing channel 9 of the container 1 can be received. This deeper recess 83 has the advantage that the container 1 can only

be placed in one manner in the receiving means, thereby securing a proper functioning and use of the apparatus.

5 The covering lid 80 is provided with a recess 84 which, when a container 1 is received in the receiving means, is placed over the zone 10b of the circumferential rim 10 near the dispensing channel 9.

10 In Fig. 9 is shown how a container 1 is placed in the receiving means 67. The perimeter of the recess 82 preferably fits around the perimeter of the circumferential rim 5 of the container 1 with the tabs 8 and 11 as is best seen in Fig. 10. In this way the container 1 can be placed only in one manner in the receiving means 67 and it is the dispensing channel 9 of the container 1 is always directed downwards such that the substance is always correctly dispensed in the cup 64 or another container positioned in the dispensing apparatus 61.

15 Then the covering lid 80 is closed such that the recess 84, is positioned over the zone 10b of the circumferential sealing seam 10 near the dispensing channel 9. The inside of the covering lid 80 forms a support surface which supports the cover sheet 7. At the position of the recess 84 the circumferential sealing seam 10 is of course not supported. Upon compression of the container body, whereby the substance is pressurized, the cover sheet 7 bulges out into the recess 84 such that the sealing seam 10 is broken at the zone 10b where the bulge is formed resulting in the container 1 being open as is described hereabove.

25 By further compression of the container body all the substance is dispensed into the cup 64 or another container. Then cold, warm or carbonated water can be added through the pipes 66a-66c. This can be done automatically as will be described further below. Then the covering lid 80 can be opened (Fig. 11) and the container 1 can be removed from the receiving means 67. Preferably there is provided a waste container 110 arranged under the receiving means 67, which can be opened by sliding it forward. The empty container 1 can fall into the waste container 110 after which the latter can be closed again.

35 In Fig. 11, but also in figs. 3, 4a-4c the container 1 is shown after compression. The bulge is indicated with reference numeral 7a. In figs. 4b and 4c is for clarity again indicated by arrows how the substance flows through the bulge 7a from the filling cavity into the dispensing channel 9.

Preferably the dispensing apparatus 61 comprises identification recognition means for automatically identifying the container 1 and the substance therein. To this end also the container 1 preferably comprises identification means. Preferably the identification means are applied to the cover sheet 7 of the container 1. The identification means could be visual identification means, e.g. a bar code or the like. Also electronic identification means are possible, more specifically comprising a resonance circuit or a transponder. The identification means applied to the container correspond to a specific substance contained in the container.

The identification recognition means could be a sensor 79 that is provided at the front plate 81 of the receiving means 67 as is shown in Fig. 7. Preferably a sensor 85, e.g. an optical sensor, a mechanical or an electronic sensor is provided on the covering lid 80 (see Fig. 8), such that when the covering lid 80 is closed the recognition means can detect if there is a container 1 present in the receiving means 67 and can recognize which container 1 with what specific substance is in the receiving means 67. The sensor 79 or 85 transfers the information from the identification means to the control system 75 (see Fig. 7) which for instance is provided with an electronic memory in which the recipes for several drinks can be stored. Another possibility is that the identification means on the container 1 contain the information for the recipe which is then transferred to the control system 75.

For example, if a container 1 with concentrated coffee substance is placed in the receiving means 67 the dispensing apparatus 61 will automatically know that there has to be added a certain predetermined amount of hot water to the cup 64.

Preferably the dispensing apparatus 61 has a control panel or control buttons 78 with which a consumer can dispense water of his choice (hot, cooled, carbonated, ambient) in the cup without placing a container 1 in the receiving means 67.

Preferably the dispensing apparatus has a display 76 connected to the control system 75. On the display 76 the drink can be displayed of which the corresponding container with the substance is placed in the receiving means 67. Also a start button can be provided by operation of which the dispensing of the substance and the water starts. In this way the consumer is allowed a last check on the

display 75 if he has placed the right container 1 in the receiving means 67.

The identification means could also correspond to the amount of substance in the container. There can be containers with different amounts of the same substance. Thus it is possible to have a container for the preparation of one glass of a drink, but it is also possible to have a container for the preparation of a whole bottle of that drink. The dispensing apparatus can determine by means of the identification means and the identification recognition means what amount of water has to be added to the substance to get the right concentration for the drink.

With regard to this aspect the apparatus is preferably able not only to recognize the container that is placed in the receiving means, but also to recognize the serving container. For example a sensor 77 (see Fig. 7) is arranged which can detect whether there is placed a bottle 230 in the apparatus 61. This sensor can be connected to the control system 75. The control system 75 can determine whether a bottle 230 is placed in the dispensing apparatus 61 if a container 1 for the preparation of a bottle is placed in the receiving means 67. If not, the control system will block the dispensing of water. In this way the spilling of fluid can be prevented in case a too small serving container is placed in the dispensing apparatus. In a preferred embodiment the top part 231 of the bottle 230 (see Fig. 23) can be provided with identification means, e.g. a certain form which fits exactly in a corresponding receiving member in the dispensing apparatus. In this manner the dispensing apparatus only works with this bottle and can be guaranteed that no spilling of the drinks can take place.

With the present apparatus 61 in combination with the container 1 the substance is directly dispensed from the container 1 in a serving container like the cup 64, a glass, a jug, a decanter, a bottle or the like. The substance is treated by mixing it in the serving container with a certain amount of water. The advantage of this is that the dispensing apparatus is not contaminated with the substance. Therefore, there cannot occur a cross-contamination between substances if different drinks are prepared subsequently. The water can be added to the substance afterward, but it is also possible to dispense water into the serving container before the

substance is dispensed into it. Also a simultaneous dispensing of substance and water is possible.

In a further embodiment of the dispensing apparatus a heating element is provided as is shown in Fig. 20. In the figure is shown a container 1 with part of the body arranged in the compression chamber 68 of the receiving means 67. The covering lid 80 is closed and supports the covering sheet 7 of the container 1. At the recess 84 in the covering lid 80 is arranged a heating element 200, which is biased against the covering sheet 7 on the extending tab 8 of the container 1 by a spring element 201 between the dispensing channel 9 and the filling cavity. Emerging from the front plate 81 of the receiving means 67 under the compression chamber 68 is arranged another heating element 202 that is biased against the backside of the extending tab 8 by a spring element 203. The heating elements 200 and 202 are used to heat the covering sheet 7 and the extending tab 8 at the zone 10b of the sealing seam 10 near the dispensing channel 9 of the container 1 before the container is compressed. In this way the sealing seam 10 is weakened at the zone 10b and will break at that zone 10b when the container body is compressed. It is also possible that one of the heating elements 200 and 202 is omitted.

In the above description the container 1 has a smooth side wall. It is however also possible to have a corrugated side wall as is shown in Fig. 12 or stepped as is shown in Fig. 13. This allows an easier compression of the respective containers 121 and 131.

Another embodiment of a container is shown in Fig. 14a. The container corresponds substantially with the container 1 shown in figs. 1-2. Therefore the corresponding elements are designated with the same reference numerals and will not be further described here.

The difference with the container from Fig. 1 is that the extending tab 8 has a dispensing channel 9 formed in it that does not end at the edge of the extending tab 8. The dispensing channel 9 thus has a closed end 9b. The extending tab 8 is provided with a transverse line of rupture 128. The line of rupture 128 crosses the dispensing channel 9b substantially perpendicular. The line of rupture 128 can be formed during production of the container 1 by applying a cross cut 130 at the underside of the extending tab 8. The cross cut 130 is shown in more detail in Fig. 14b. The cut 130 extends partly through the thickness of the tab 8. The covering sheet

7 can be provided with a prescore at the location corresponding to the line of rupture 128.

In use a consumer can separate the end part 8b of the extending tab 8 from the rest by pulling it upwards, as is illustrated in Fig. 14a by the arrows 129. The extending tab 8 will break at the rupture line 128 and the part 8b with the piece of covering sheet applied thereto will be separated which leaves the dispensing channel 9 with an opened end 9a, as is shown in Fig. 14c. The container 1 can then be placed into the dispensing apparatus 67 for further use. The advantage of this container 1 is that the dispensing channel 9 is sealed from the environment until the moment of actual use, whereby the risk of contamination with dirt or the like is eliminated. A hygienic container is thus provided which is well adapted for the use with food products.

In another embodiment of the container is shown in Fig. 15 in a top view. The circumferential rim 5 has a flat extending tab which is covered by the cover sheet. In the figure the cover sheet is not shown, to make the sealing seams visible. The cover sheet is sealed to the extending tab 8 by at two substantially parallel sealing seams 135 which extend outwardly from the circumferential sealing seam 10 to the edge of the extending tab 8. When in use the circumferential seal 10 breaks at the zone 10b the substance will flow from the filling cavity through the dispensing passage formed by the tab surface and the covering sheet, between the two sealing seams 135 as is indicated by the arrows. At the edge of the extending tab 8 there can be provided an extra seal 136, but this end could also be open, i.e. not sealed to the tab 8.

Fig. 16 shows still another embodiment of a container. In the figure only the container body is shown. The elements of the container 161 that correspond to the elements of container 1 of Fig. 1 are indicated with the same reference numerals to which 160 is added. These elements will not be described here. The difference with the embodiment from Fig. 1 is that this embodiment has two filling cavities. The two filling cavities can contain different substances which have to be mixed. This can be useful in preparing certain drinks or food products, e.g. yogurt with syrup, coffee with cream but also an application where epoxy has to be prepared is possible.

The filling cavities can have the same volume as is shown in fig 16 and Fig. 18, but it is also possible that the filling cavities have a different volume as is shown in Fig. 17 and Fig. 19.

5 In Fig. 17 a container 170 is shown that has filling cavities with the same cross section, but with a different height. When this container 170 is compressed by a dispensing apparatus 67, the piston will first engage the bottom 173a corresponding to the filling cavity with the largest height and later the bottom 173b of the filling cavity with the smaller height. This is for example practical if
10 yogurt has to be served with syrup or a sauce on top.

In Fig. 19 a container 191 is shown that has filling cavities with different cross sections.

Of course it is also possible to have a container with filling cavities with a different height and with a different cross section.

15 In all embodiments of figs. 16-19 the substances from the two filling cavities are dispensed through one dispensing channel 169, 189, 199.

The containers filled with substance hereabove described are preferably manufactured by a method, wherein the containers are
20 formed from a sheet of plastic material. First a flat sheet of plastic material is placed in a vacuum forming apparatus with a forming die. By vacuum forming the filling cavities into the die, multiple container bodies are formed simultaneously in the sheet. Possibly also dispensing channels 9 of the containers 1 are depressed
25 by the vacuum forming machine in an extension tab, which is subsequently to be formed in the punch machine. The sheet with the filling cavity is placed in a filling machine and filled with substance. Subsequently a sheet 7 of covering foil is sealed over the sheet with the container bodies. Finally, the sheet with the closed
30 containers is placed in a punch machine, where the perimeter of the circumferential rim of the body is formed by punching out waste material between the containers 1.

In the above described manner is also possible to manufacture two different types of containers simultaneously from one sheet. This
35 is advantageous when two containers are to be used together. A possible application is that one container is like the container 1 already described, whereas the other container contains an additional food product. As an example one can think of a container with

substance for soup that is placed in the receiving means 67 of the dispensing apparatus 61, and a second container filled with croutons that have to be added to the soup by the consumer after the apparatus 61 has prepared the soup.

5 In the above description the use for dispensing food products is mentioned. The container can be filled with concentrate for coffee, tea, chocolate, soup, dairy products like milk or yogurt drinks, fruit and vegetable juices, soft drinks and sport drinks.

10 The use of dispensing a substance from a container in the manner, as is described hereabove is however not only delimited to applications with food products. It is also possible to use this principle in non-food applications, e.g. in medical applications for dispensing a dose of a medicament.

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CLAIMS

1. In combination:

- a container filled with a single portion of a substance, comprising
5 a deformable body defining a filling cavity which body has an opening
and an integral planar circumferential rim surrounding said opening,
which opening is closed by a cover sheet of foil material which is
sealed to the circumferential rim by means of a circumferential
sealing seam, wherein the container is provided with identification
10 means corresponding to the substance contained in the container so as
to allow automatic identification of the container,
- a dispensing apparatus comprising receiving means for receiving the
container, which apparatus is adapted to open the container and
comprises identification recognition means for automatically
15 identifying the container and the substance therein.

2. Combination according to claim 1, wherein the identification means
are applied to the cover sheet of the container.

20 3. Combination according to claim 2, wherein the identification means
are visual identification means, for example a bar code.

4. Combination according to claim 2, wherein the identification means
comprise electronic identification means.

25 5. Combination according to claim 4, wherein the electronic
identification means comprise a resonance circuit.

6. Combination according to claim 4, wherein the electronic
30 identification means comprise a transponder.

7. Combination according to any of the claims 1-6, wherein the
dispensing apparatus comprises compression means for compressing the
container body and wherein the sealing seam of the container on a
35 predetermined location has a weak spot such that the seal breaks at
that weak spot upon pressurizing the content of the container by
compressing the container body.

8. Combination according to any of the preceding claims, wherein the dispensing apparatus comprises treatment means for treating the substance dispensed from the container.

5 9. Combination according to claim 8, wherein the treatment means comprise liquid dispensing means for a liquid to be mixed with the substance from the container.

10 10. Combination according to claim 9, wherein the liquid dispensing means for liquid comprise means for dispensing cooled water and/or hot water and/or water with ambient temperature.

15 11. Combination according to claim 8 or 9, wherein the dispensing means for liquid comprise means for dispensing carbonated water.

12. Combination according to any of the above claims, wherein the receiving means of the dispensing apparatus have a compression chamber with a variable volume for receiving the container body, a stop face engaging the back side of the circumferential rim and a
20 covering lid with a supporting face for engaging the cover sheet of the container.

13. Combination according to claim 12, wherein the covering lid is provided with a recess arranged such that when the covering lid is
25 closed it is positioned over a part of the sealing seam, so as to allow the cover sheet to bulb out into the recess upon compression of the container body and the sealing seam to break.

14. Combination according to any of the above claims, wherein the
30 compression chamber is provided with a piston coupled to drive means, which piston is adapted to engage the container body.

15. Combination according to claim 14, wherein the drive means
35 comprise a screw spindle and an electric motor.

16. Combination according to claim 14, wherein the drive means
comprise pneumatic means.

17. Combination according to claim 14, wherein the drive means comprise hydraulic means.

18. Combination according to claim 14, wherein the drive means are
5 adapted to be hand driven.

19. Combination according to any of the preceding claims, wherein the covering layer of the container is made of a multilayer material.

10 20. Combination according to any of the preceding claims, wherein the dispensing apparatus has dispensing means for different sorts of water, e.g. hot water, cooled water and carbonated water, which are positioned such that the different sorts of water can be dispensed at one point in a serving container like e.g. a cup or a bottle.

15

21. Container for containing a substance, comprising a deformable body defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed
20 to the circumferential rim by means of a circumferential sealing seam, wherein the circumferential rim has an extending tab with a dispensing channel formed by a depression in the tab which is covered by the cover sheet, the dispensing channel being closed off from the filling cavity by the circumferential sealing seam.

25

22. Container according to claim 21, wherein the circumferential sealing seam at the location between the channel and the filling cavity is weakened, e.g. by a decreased seam width, such that upon pressurizing the content of the container by compressing the
30 container body the seal breaks at that location and a passage is formed between the cover sheet and the rim so as to allow substance to pass through the passage from the cavity into the channel.

23. Container according to claim 21 or 22, wherein the channel has an
35 end at the edge of the extending tab.

24. Container according to claim 23, wherein the end at the edge of the extending tab is open.

25. Container according to claim 24, wherein the end of the channel at the edge of the extending tab is sealed.

5 26. Container according to claim 21-25, wherein the container body is corrugated so as to facilitate compression of the container.

10 27. Container for containing a substance, comprising a deformable body defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed to the circumferential rim by means of a circumferential sealing seam, wherein the circumferential rim has a flat extending tab which is covered by the cover sheet, which cover sheet is sealed to the
15 extending tab by at least two substantially parallel sealing seams which extend outwardly from the circumferential sealing seam to the edge of the extending tab.

20 28. Container according to claim 27, wherein the circumferential sealing seam at the location between the two parallel sealing seams is weakened, e.g. by a decreased seam width, such that upon pressurizing the content of the container by exerting a compression force on the wall the seal breaks at that location and a dispensing passage is formed between the two parallel sealing seams, the cover
25 sheet and the surface of the extending tab.

29. Container according to any of the claims 21-28, wherein a gripping tab is provided at the circumferential rim.

30 30. Container according to claim 29, wherein the gripping tab is situated diametrically opposite the extending tab.

31. Container according to any of the claims 21-30, wherein the container wall is formed of a plastic material.

35 32. Container according to any of the claims 21-31, wherein the covering layer is made of a multilayer material.

33. Container according to any of the claims 21-32, wherein the container body is formed by vacuum forming and/or thermo forming.

5 34. Container according to any of the claims 21-33, wherein the deformable body comprises a bottom and a side wall extending upwardly from the bottom.

35. Method for manufacturing containers according to one of the above claims, wherein

- 10 - a flat sheet is placed in a vacuum or thermo forming apparatus with a forming die and multiple container bodies are formed simultaneously in the sheet by vacuum forming the filling cavities into the die,
- the sheet with the filling cavity is placed in a filling machine and filled with substance,
15 - a sheet of covering foil is sealed over the sheet with the container bodies,
- the sheet with the closed containers is placed in a punch machine, where the perimeter of the circumferential rim of the body is formed by punching out waste material between the containers.

20

36. Method according to claim 35, wherein in the vacuum forming machine also dispensing channels of the containers are depressed in an extension tab which is subsequently to be formed in the punch machine.

25

37. Method according to claim 35, wherein the sheet of covering foil is manufactured and provided with identification means.

30 38. Method for opening a container containing a substance, comprising a deformable body (made of sheet material) defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed to the circumferential rim by means of a circumferential sealing seam,

35 the method comprising the steps of:

- holding the container,
- engaging the cover sheet with a support surface provided with a recess and adapted to support the cover sheet except at the position

of the recess, wherein the recess is positioned at least over a part of the circumferential sealing seam,

- compressing the container body whereby the substance is pressurized and the cover sheet bulges out into the recess such that the sealing seam is broken at the location where the bulge is formed resulting in the container being open.

39. Method for opening a container containing a substance, comprising a deformable body (made of sheet material) defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed to the circumferential rim by means of a circumferential sealing seam,

the method comprising the steps of:

- holding the container,
- engaging the cover sheet with a support surface provided with a recess and adapted to support the cover sheet except at the position of the recess, wherein the recess is positioned over at least a part of the circumferential sealing seam,
- heating the sealing seam at a position facing the recess, whereby the sealing seam is locally weakened,
- compressing the container body whereby the substance is pressurized and the cover sheet bulges out into the recess such that the sealing seam is broken at the location where the bulge is formed resulting in the container being open.

ABSTRACT

The invention proposes to dispense a substance from a container filled with a single portion of a substance. The container comprises
5 a deformable body, preferably made of sheet material, defining a filling cavity which body has an opening and an integral planar circumferential rim surrounding said opening, which opening is closed by a cover sheet of foil material which is sealed to the circumferential rim by means of a circumferential sealing seam. The
10 container with the substance is opened by making use of the deformability of the cover sheet. A support surface supports the cover sheet except at the position of a recess. The recess is positioned at least over a part of the circumferential sealing seam. Upon compression of the container body the substance is pressurized
15 and the cover sheet bulges out into the recess such that the sealing seam is broken at the location where the bulge is formed resulting in the container being open.

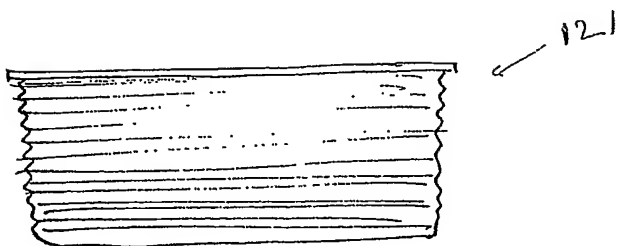
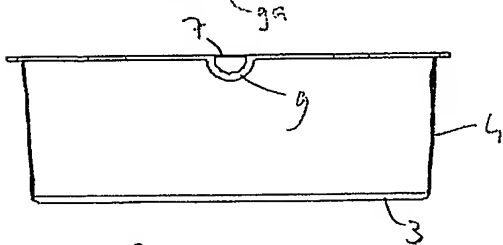
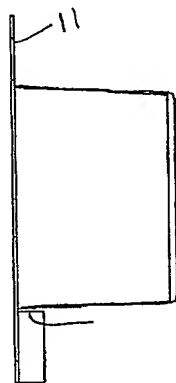
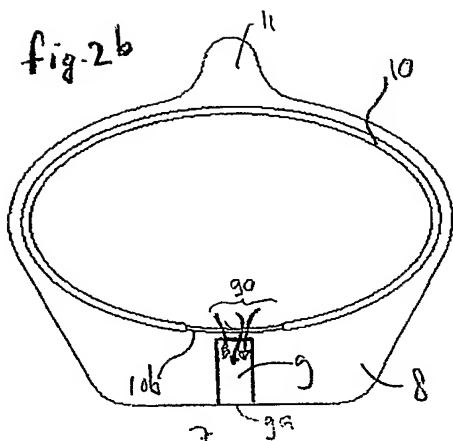
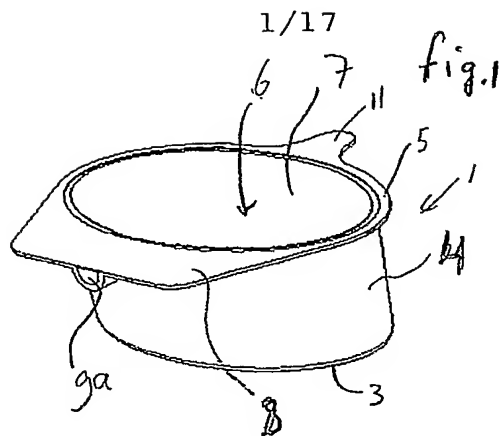


fig. 3

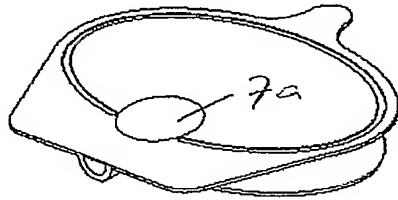


fig. 4b

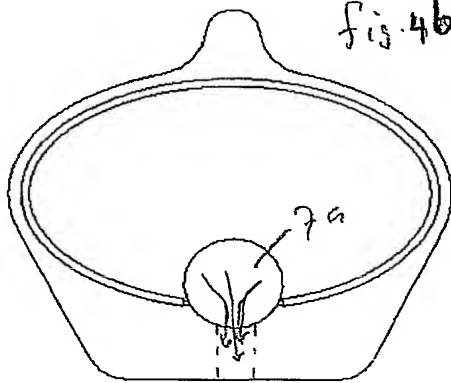


fig. 4c

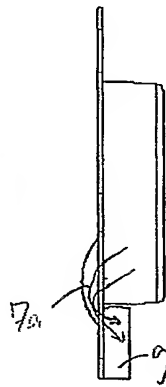
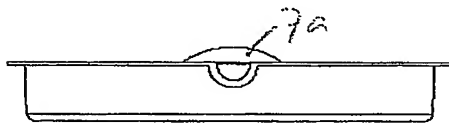


fig. 4a



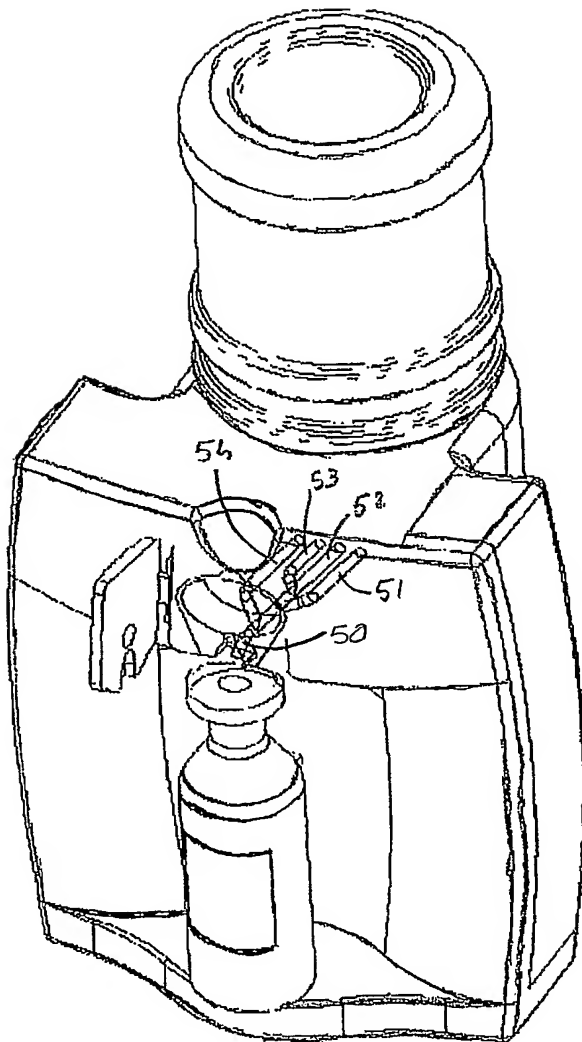


fig. 5

fig. 6

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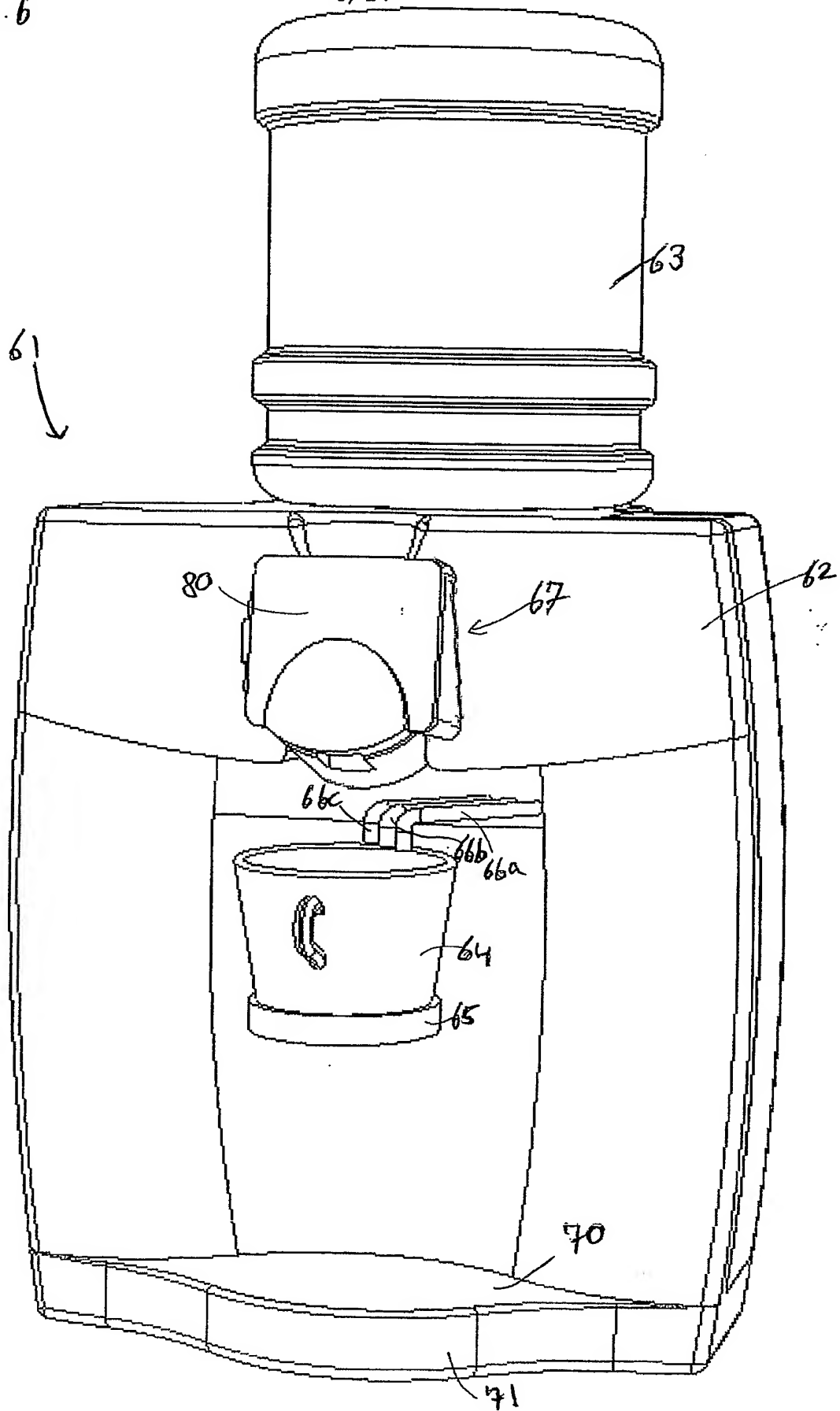
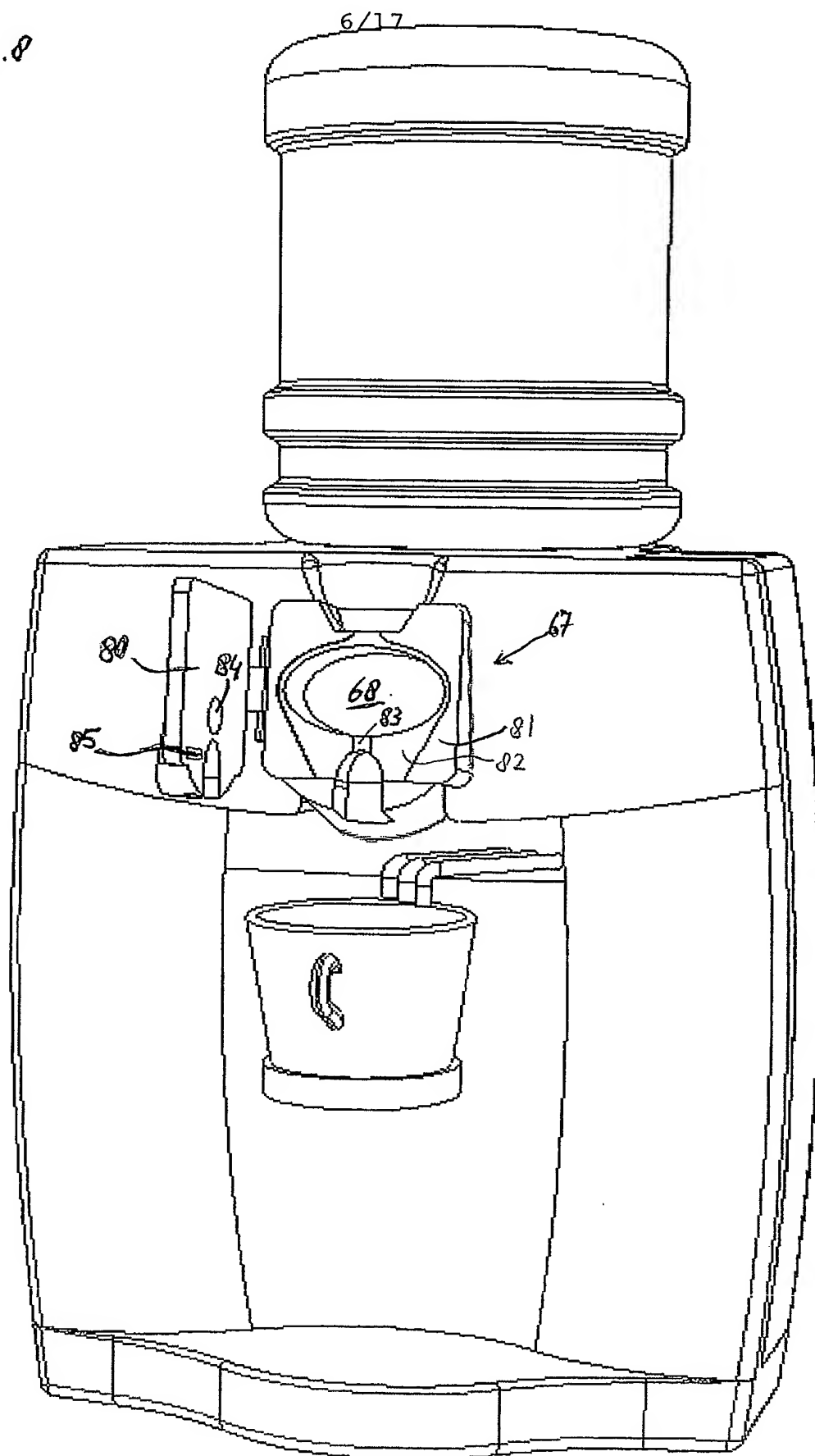


Fig. 8



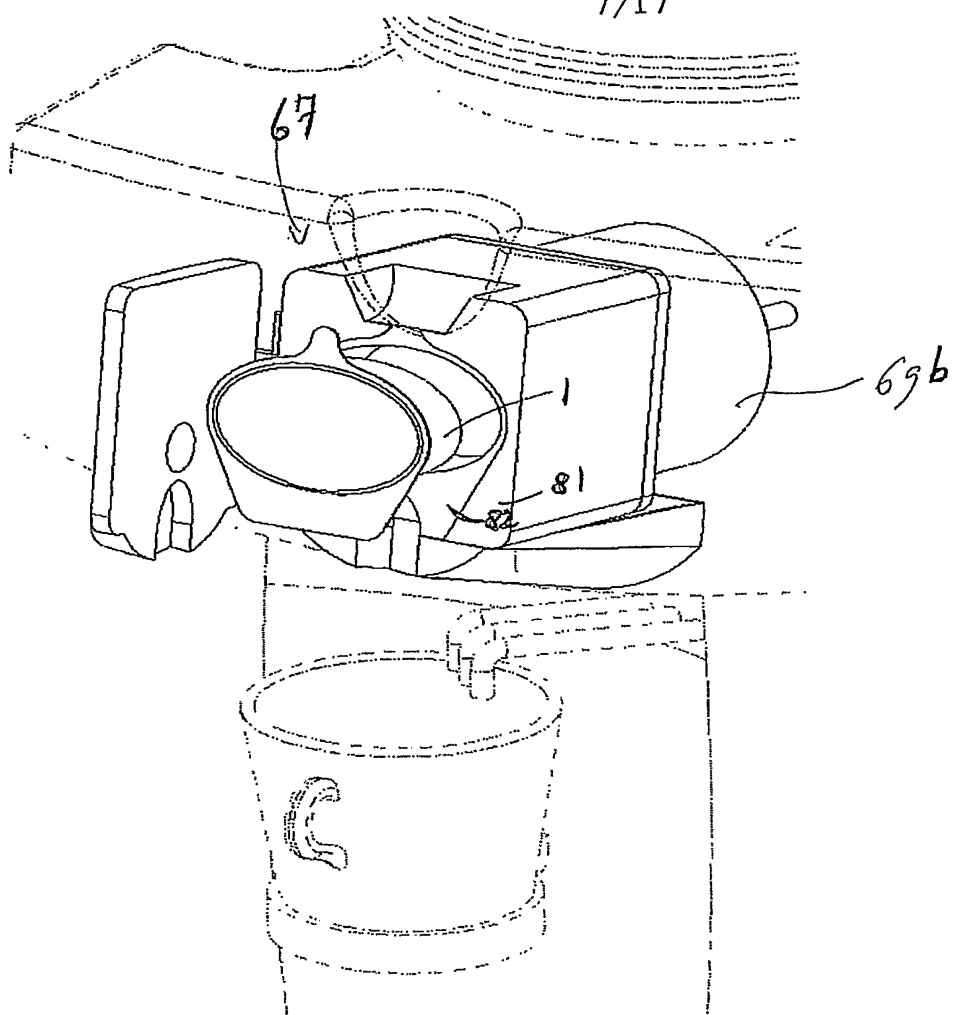


fig. 9

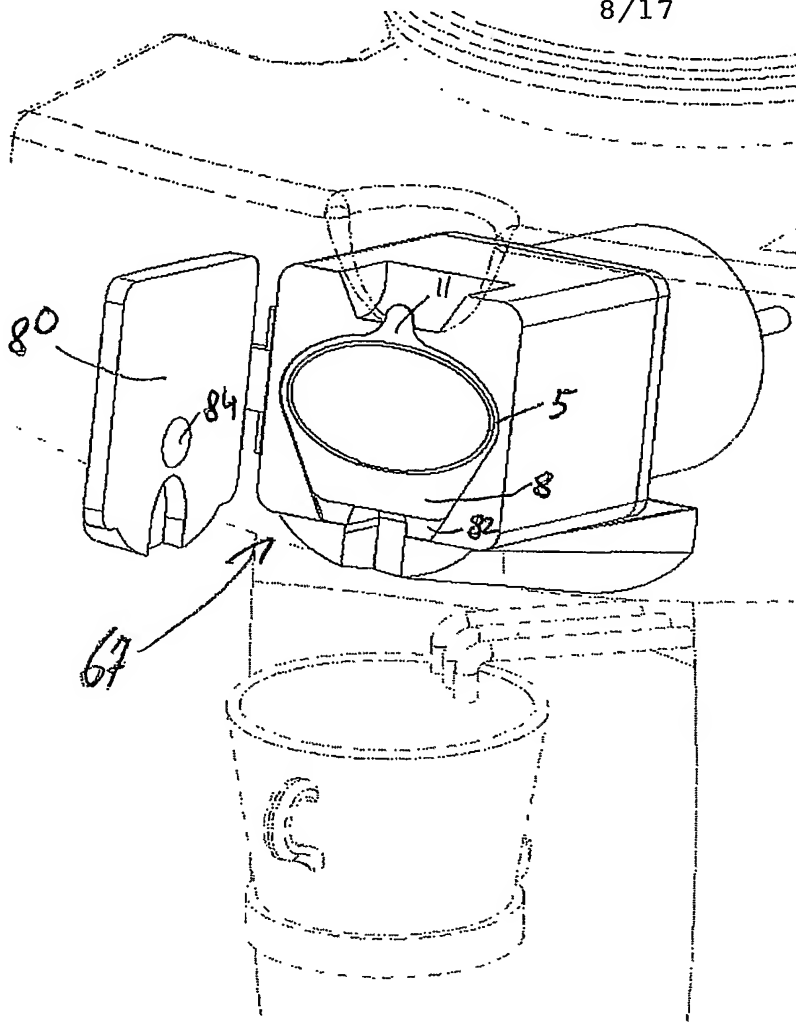


fig. 10

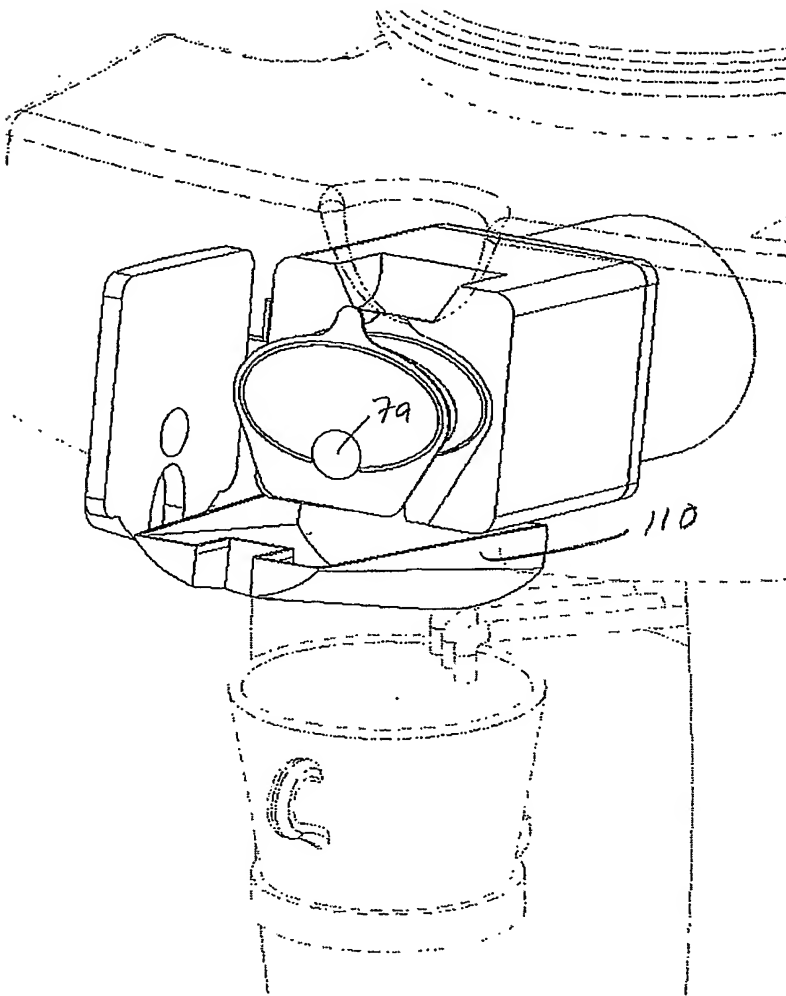
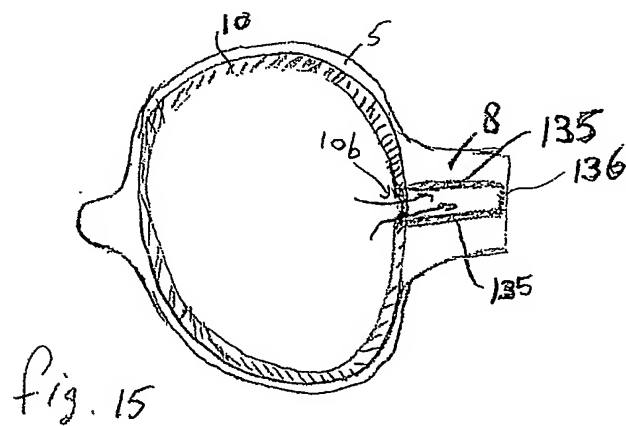
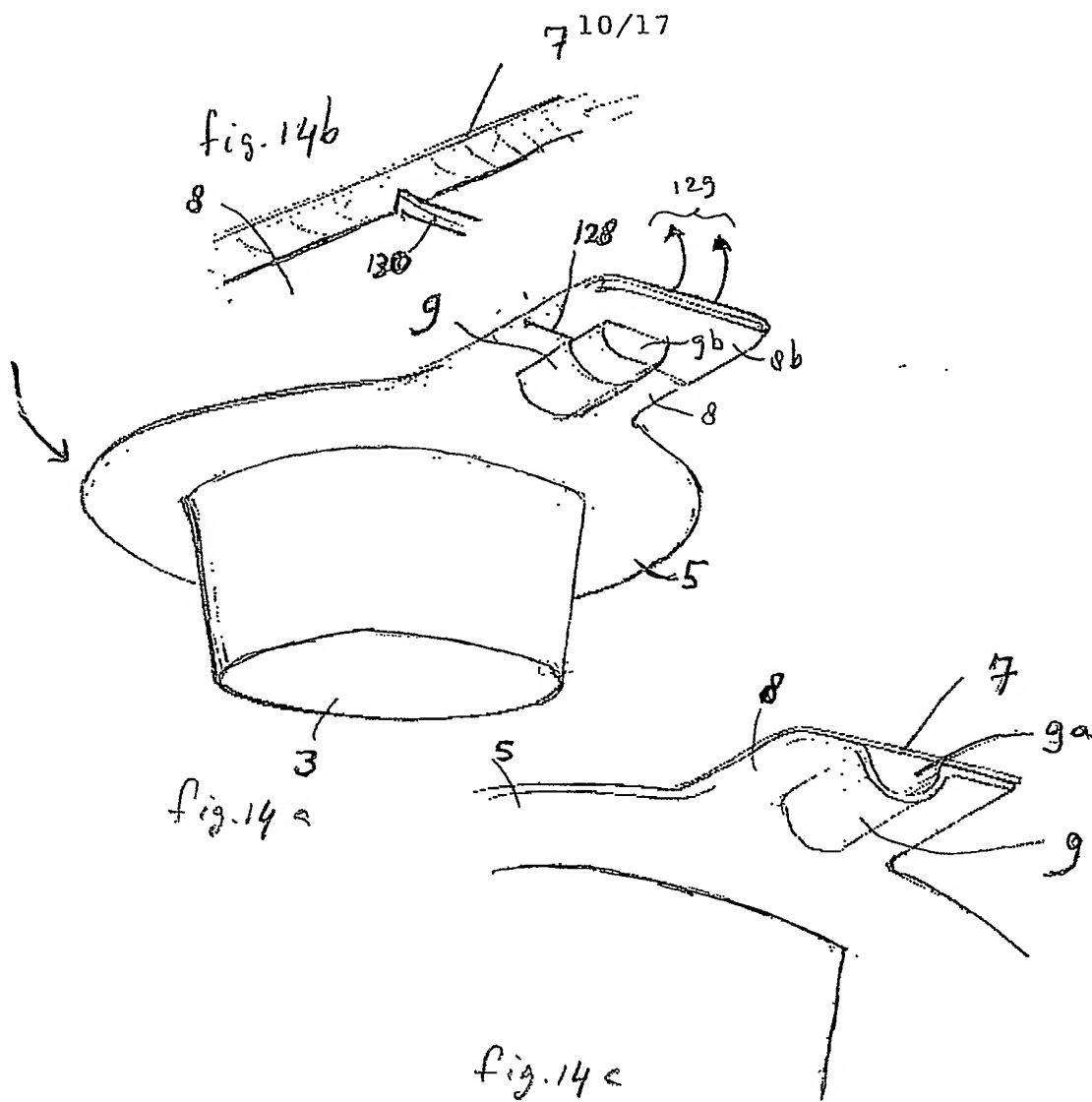
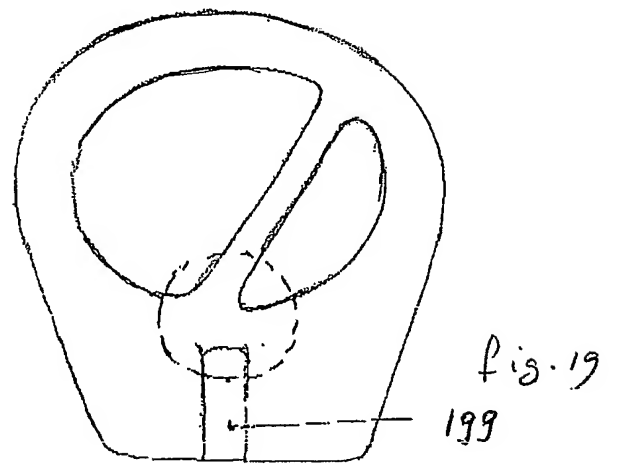
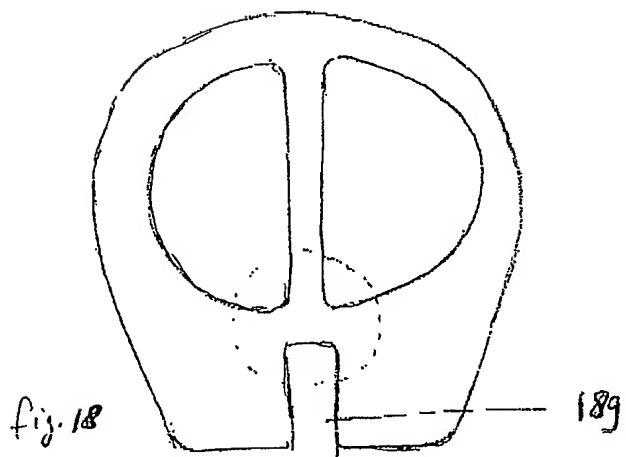
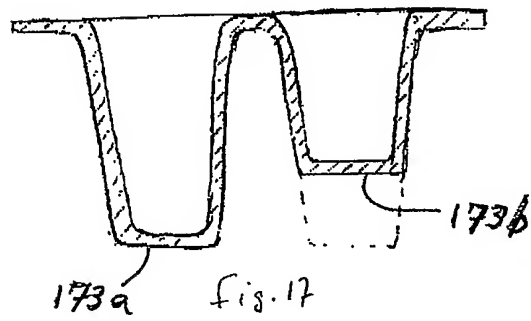
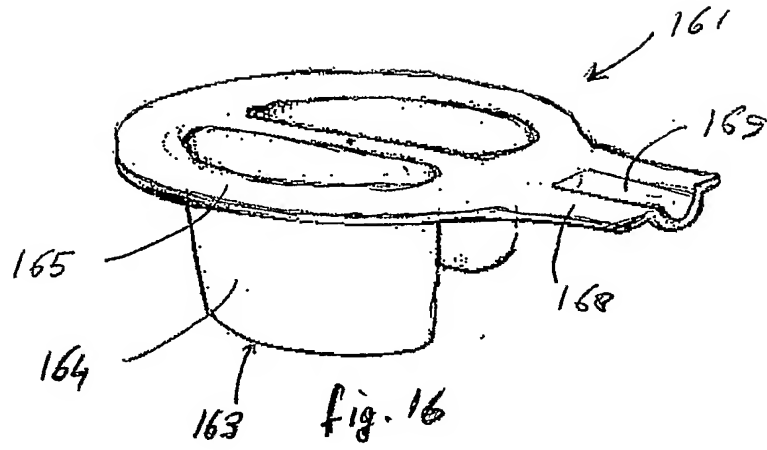
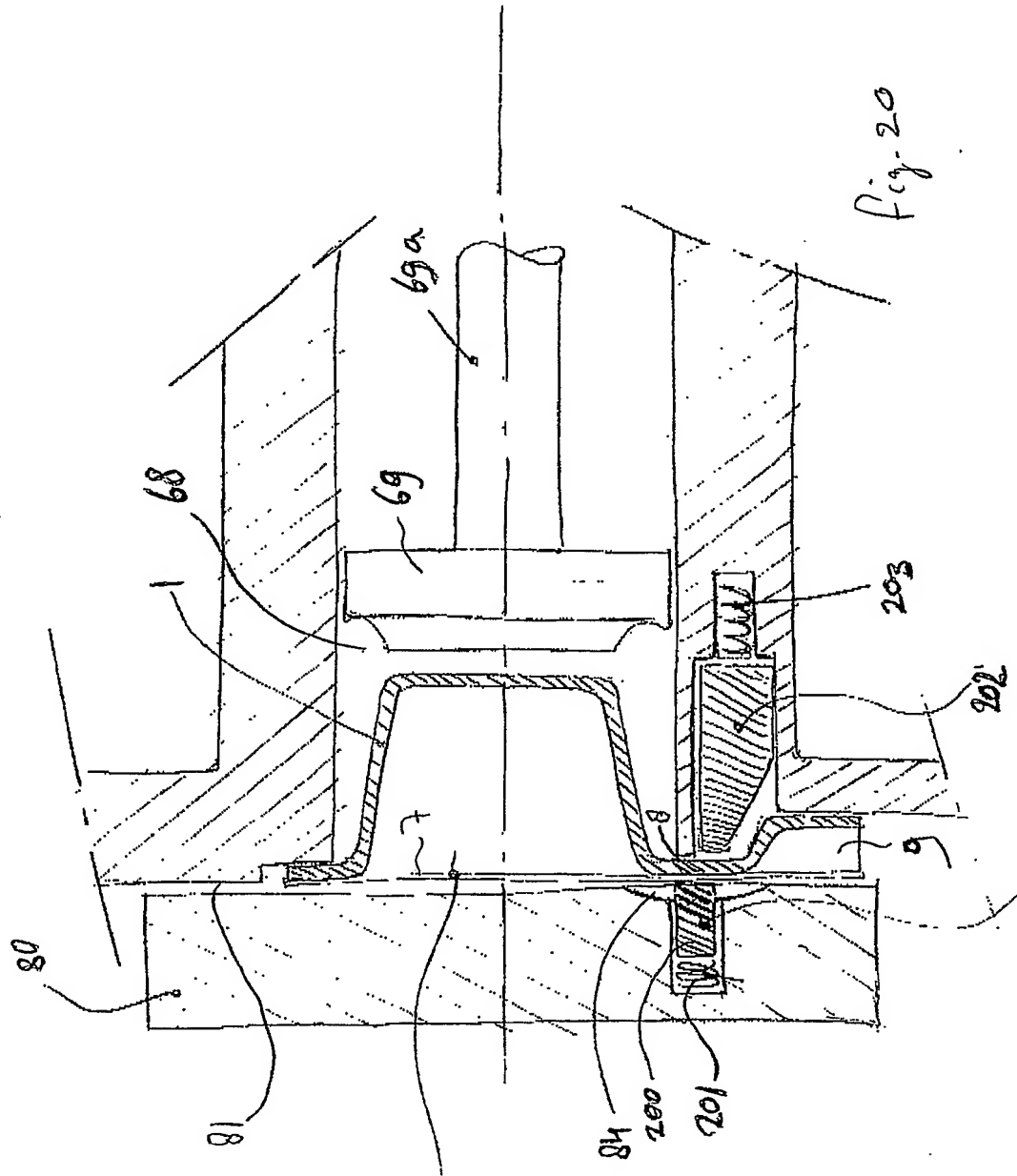


fig. 11







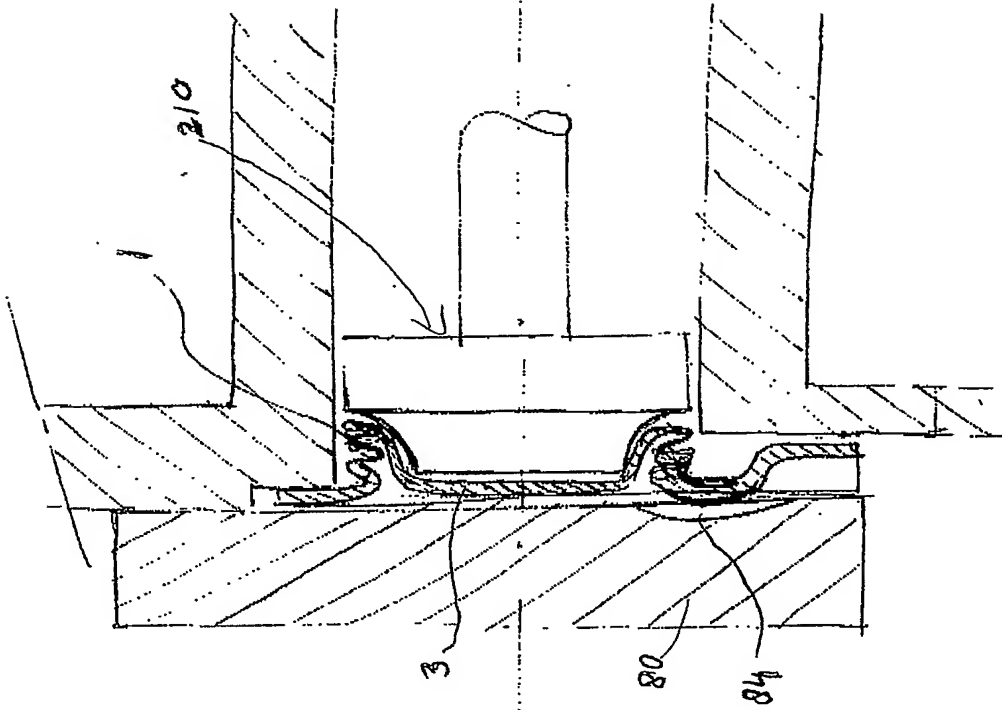


fig. 21b

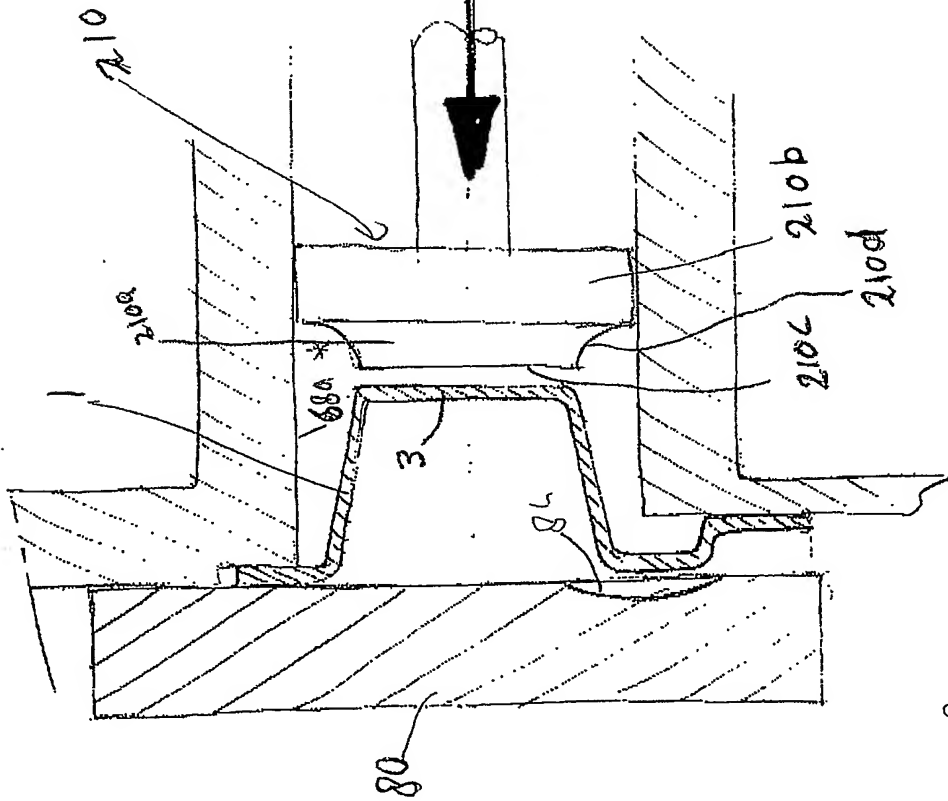


fig. 21a

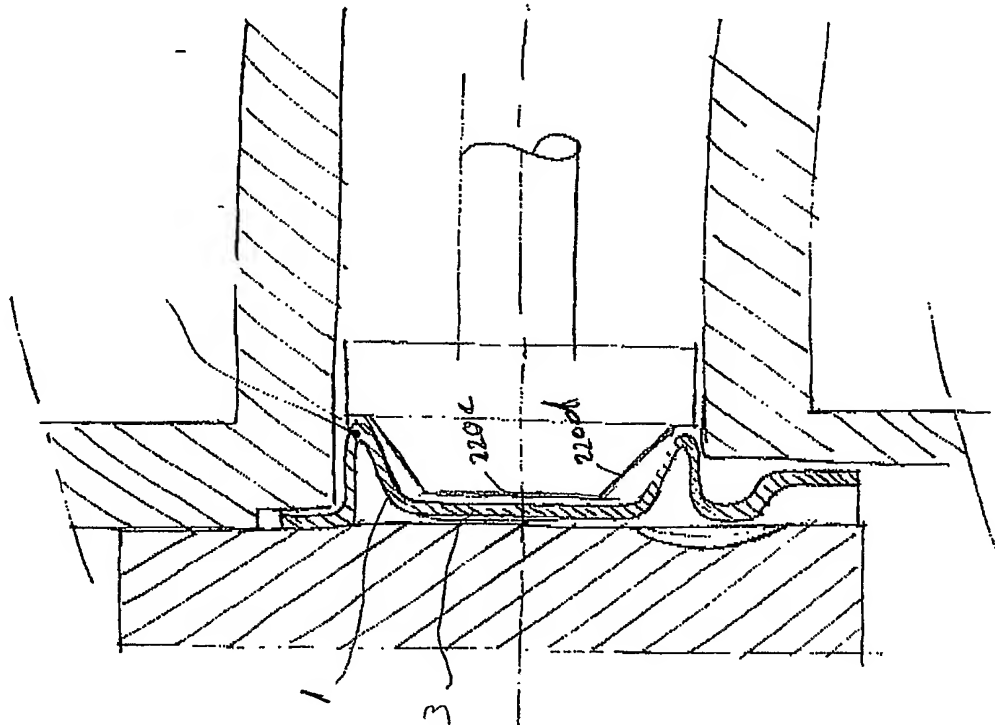


Fig. 22b

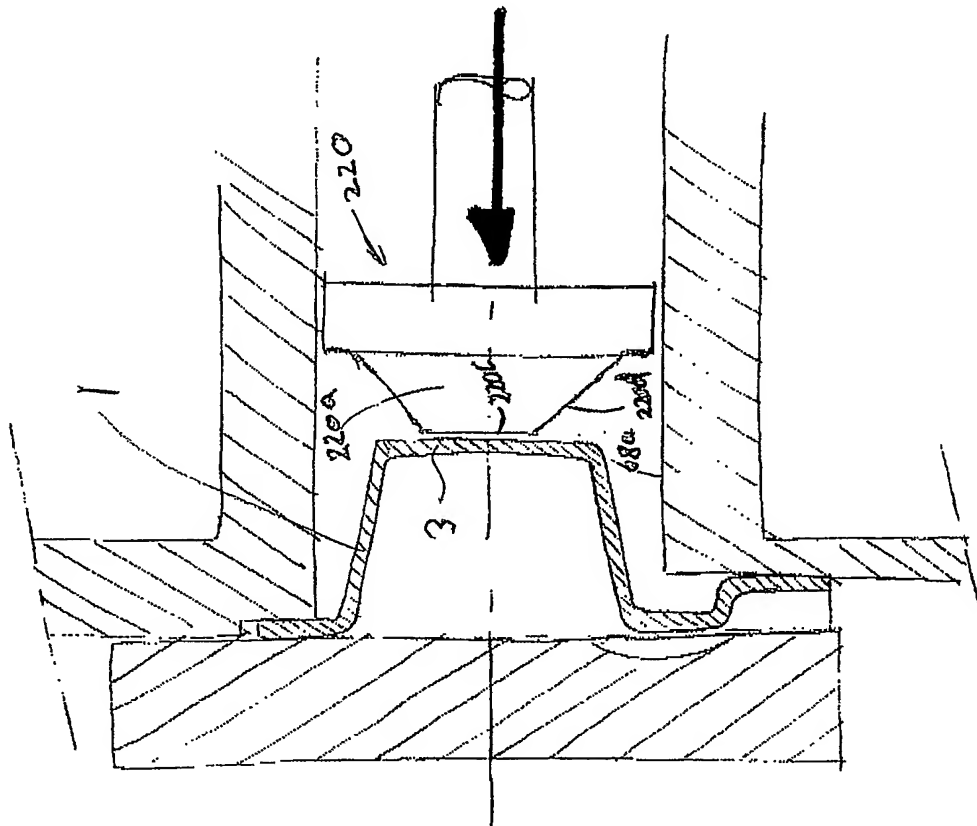


Fig. 22a

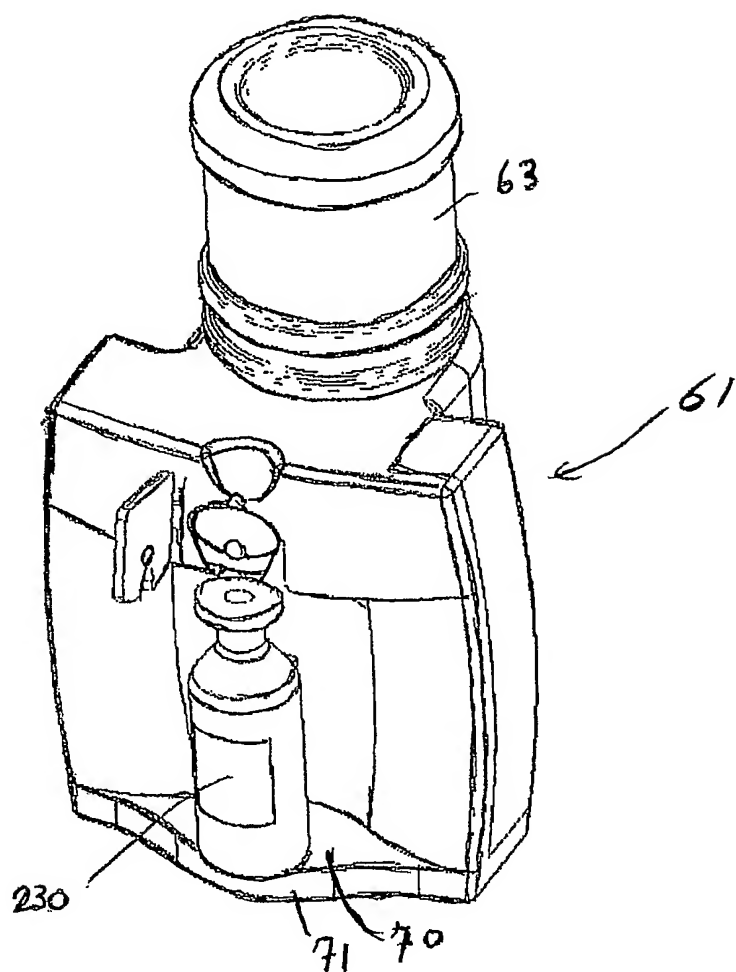


fig. 23a

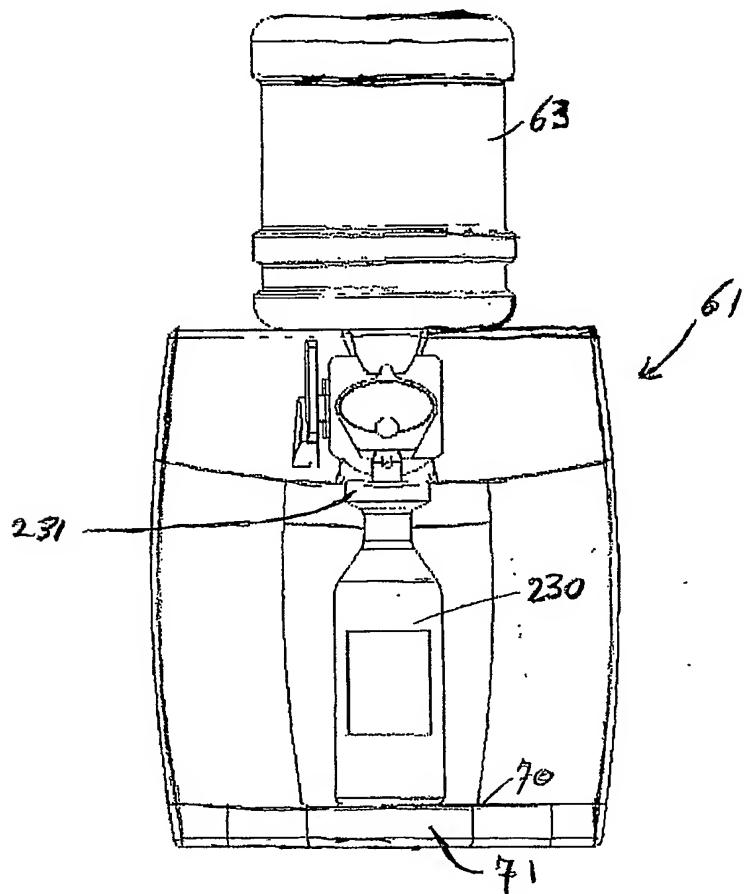


fig. 23b

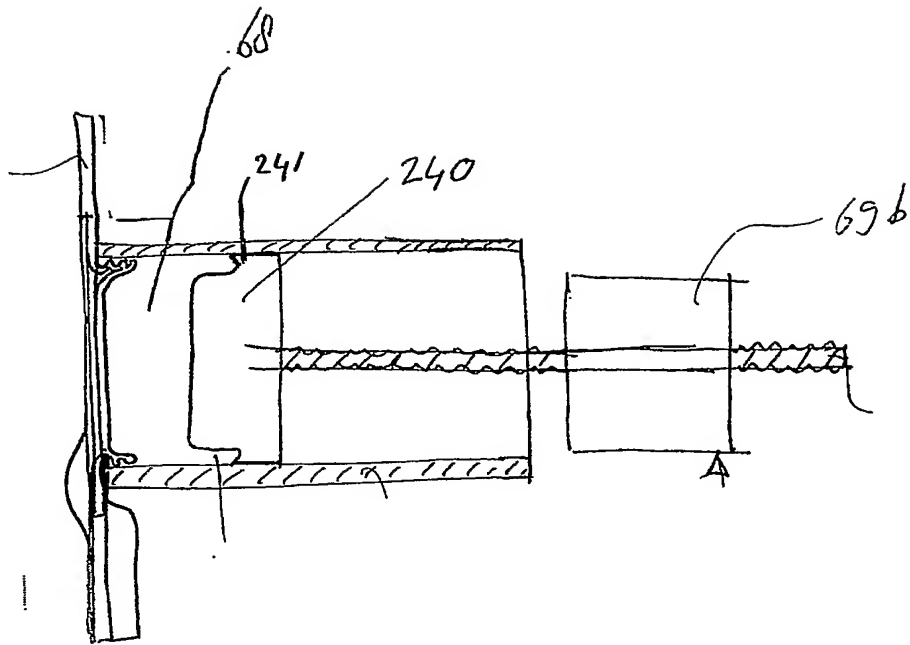


fig. 24

